

be used during day and night, and capable of transmitting and receiving messages over a distance of at least one hundred miles.

IN "Relative Bestimmungen der Intensität der Schwerkraft" (Karlsruhe: G. Braun), Dr. E. Becker gives the results of a series of pendulum experiments conducted during the years 1900-05 in Alsace-Lorraine. The work of the group of experimenters concerned appears to have been very carefully performed and the reductions of the observations have been carried out with a due recognition of the systematic errors likely to be present. Using Helmert's system of corrections to sea-level and giving to the ideal surface layer of land a density of 2.4, the experimenters find the western Rhine valley to be a region where gravity has its normal value. In general the higher land to the west is a region of gravity-excess. The map which accompanies the work would enable the reader to make a more intelligent use of the tabulated results if by shading or otherwise it gave an idea of the level contours or of the geological distribution. That would at once confirm or disprove the idea left by the table that no marked correlation between gravity-variation and height or geological conditions has been found. Another useful addition to the work would have been some illustrations of the apparatus used and described. It is to be hoped that the experiments will be extended as suggested in the last sentence of the memoir.

THE volume of Contributions from the Jefferson Physical Laboratory of Harvard University for the year 1911 extends to nearly 400 pages, and contains eight memoirs, several of which we have already noticed in these columns. More than half the present volume is occupied by the important papers of Bridgeman on the properties of water and of mercury at pressures up to 20,000 kilogrammes per square centimetre, and at temperatures between -80° and $+80^{\circ}$ C. In addition to the new information these papers supply as to the various modifications of ice and the conditions of equilibrium amongst them, they show that the laws of change of state from solid to liquid are much simpler than the theories and observations of Tammann and of van Laar have led us to believe. Each melting point, for instance, changes with pressure in the same direction at these great pressures as it does at lower pressures, so that there is no maximum melting point in the case of mercury or minimum in the case of water. It seems probable that the maxima observed by Damien were due to slight impurities, too small to have observable effects on the melting points at low pressures, but which appear to have considerable effects at these high pressures.

A COPY has been received of the third edition of "The Record of the Royal Society of London," prepared in connection with the celebration of the 250th anniversary of the foundation of the society. The volume, which may be obtained of Mr. Henry Frowde, Amen Corner, E.C., price 15s. net, is much larger and more complete than previous editions, and is a

valuable official statement of the development and position of our leading society for the promotion of natural knowledge. The chapter of greatest general interest is that with which the volume opens, on the foundation and early history of the society. This has been re-written by the president, Sir Archibald Geikie, who has also supervised and edited the whole work. The three charters are printed in full, with translations, while other chapters are devoted to the statutes, trusts, benefactions, medallists, committees, and like matters. There is a chronological register of fellows, as well as an alphabetical list, with dates of election. The volume is illustrated by twenty excellent plates, mostly from portraits of former fellows in the society's possession. Among the additions to the new edition are portraits of Lord Kelvin, Lord Lister, and Charles Darwin. The officers and the clerical staff have been successful in producing an attractive volume of more than domestic interest.

MR. C. BAKER, 244 High Holborn, has just issued a new classified list of second-hand instruments for sale or hire. The catalogue contains particulars and prices of more than fifteen hundred optical and other instruments and accessories offered at low prices. Every instrument is guaranteed to be in adjustment, having been put in order where necessary in Mr. Baker's workshops or in the works of the original makers.

FIFTY volumes of the "Cambridge Manuals of Science and Literature" have now been published by the Cambridge University Press. Among the most recent additions may be mentioned "The Work of Rain and Rivers," by Prof. T. G. Bonney, F.R.S.; "Brewing," by Mr. A. Chaston Chapman; "The Individual in the Animal Kingdom," by Mr. Julian S. Huxley; "House-flies and How they Spread Disease," by Dr. C. G. Hewitt; and "The Psychology of Insanity," by Dr. Bernard Hart. We notice, too, that Mr. L. Doncaster's volume in the series, "Heredity in the Light of Recent Research," has reached a second edition, in which a chapter on heredity and sex has been added.

OUR ASTRONOMICAL COLUMN.

GALE'S COMET, 1912a.—No. 4602 of the *Astronomische Nachrichten* contains new elements for comet 1912. A set by Mr. H. E. Wood puts the perihelion passage back to October 186, and reduces the inclination of the orbit to $51^{\circ} 54'$; another by Mr. Merfield agrees fairly well with that published by Dr. Ebell, who gives a new ephemeris, derived from corrected elements, from which the following is taken:—

Ephemeris, 12h. M.T. Berlin.					
1912	α (true) h. m.	δ (true)	log r	log Δ	Mag.
Oct. 13 ...	15 43.4 ...	+ 8 27.1 ...	9.8673 ...	0.0454 ...	6.3
15 ...	15 46.2 ...	+ 10 28.3			
17 ...	15 48.7 ...	+ 12 23.9 ...	9.8806 ...	0.0588 ...	6.4

It will be observed that this ephemeris gives the declination for October 13 nearly 1° more northerly than that we gave, from the earlier ephemeris, last week; the calculated magnitude is also considerably fainter. An observation by M. Gonnessiat at Algiers on September 26 gave the magnitude as 8.0.

SUN-SPOT ACTIVITY.—There has recently been some slight suggestion of a recrudescence of sun-spot activity, although one scarcely expects the actual minimum to have passed yet.

In the earlier part of the year very few spots were seen, and those that did appear were very small and seemed to be very shallow, for they generally filled up and disappeared while the region was still on the visible hemisphere. One exception was a fairly large black circular spot, which endured from June 17 to 28, and on Saturday last there appeared a small group, containing two intense nuclei, just south of the sun's centre, on the central meridian; this is now a fair-sized group, and should be seen near the western limb about October 11 or 12.

THE SYSTEMATIC MOTIONS OF SUN-SPOTS.—Acting on a suggestion conveyed to him by the statement that "the rotation periods given by different spots in the same zone of latitude differ more widely than do the mean rotation periods for different zones of latitude," given in Mr. and Mrs. Maunder's paper on the solar rotation period, Prof. Hirayama has analysed the motions of spots given in the Greenwich, Carrington's, and Spörer's publications, and finds that apparently there are two drifts of sun-spots exhibiting distinctive systematic motions. The angular velocity of drift i. is represented by $\xi = 14.37^\circ - 2.97^\circ \sin^2 \lambda$ (where λ = the heliographic latitude), and of drift ii. by $\xi = 14.69^\circ - 2.65^\circ \sin^2 \lambda$; the former agrees fairly well with the mean values found by other investigators, while the latter exceeds it, showing a mean rate about 0.35° greater than that indicated by drift i. For the lower latitudes, the rotation period proper to drift ii. agrees fairly well with that found spectroscopically by Messrs. Storey and Wilson, and Prof. Hirayama suggests that possibly certain groups of spots, by a proper motion of their own, come to the same level as the chromospheric layer investigated spectroscopically, and attain its angular velocity. He also suggests that this idea of two drifts may explain the distribution of sun-spots with different rotation periods in any particular zone of latitude. The data considered by him show that there are about twice as many sun-spots collected in drift i. as in drift ii. (*Journal of the College of Science, Imperial University, Tokio*, vol. xxxii., No. 7.)

THE PARALLAX OF NOVA LACERTÆ.—In No. 52 of the *Mitteilungen der Nikolai-Hauptsternwarte zu Pulkowo*, Herr Balanowsky discusses the attempt made at Pulkowa to determine the parallax and proper motion of Nova Lacertæ. Sixteen plates were taken between January 4, 1911, and February 19, 1912, but two had to be rejected because the images were poor. The first solution from the remaining fourteen plates gave values which were small as compared with their probable errors, but indicated that the proper motion in declination was probably zero. The final solution gave for the value of the parallax $0.005'' \pm 0.020''$, which practically means that it was zero, and indicated that the proper motion in right-ascension did not exceed $\pm 0.01s$.

THE ROYAL HUNGARIAN ASTROPHYSICAL OBSERVATORY.—In No. 14 of the *Kleinere Veröffentlichungen des Königl. Ungarischen Astrophysikalischen Observatoriums*, Dr. Konkoly gives a very detailed description of the instruments added to the equipment of the observatory between the beginning of 1908 and the end of 1911. Many of the instruments have been made for special purposes, and the book, consisting of 166 pages, fully illustrated, should prove exceedingly useful to anyone desiring to set up instruments for astrophysical researches.

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OBSERVATIONS OF VARIABLE STARS.—In No. 9 (vol. i., second series) of the *Memorie della Società degli Spettroscopisti Italiana*, Signor E. Padova publishes the values and light curves determined from observations of variable stars during the years 1907–11. Eleven stars are dealt with, and these are divided into three groups, viz. Algol variables, short-period, and long-period variables. In several cases the light-curves are compared, graphically, with those drawn from published elements, or determined by other observers, and the differences between them are discussed. For Mira Ceti the observer found a minimum of magnitude 9.36 on January 15, 1912.

BIRD NOTES.

IN the August *Zoologist* Mr. Collingwood Ingram points out that four races of the furze-warbler are recognisable, namely, the typical *Sylvia undulata* of the northern Mediterranean countries, *S. u. aremoricus* of the Atlantic coast of France and Spain, the north African *S. u. toni*, and the British *S. u. dartfordiensis*, a Dartford warbler, the last being distinguished by its brown back and the smaller development of the white tips to the throat and breast feathers.

The migratory birds visiting the Buffalo River district form the subject of an article by the Rev. R. Godfrey in the June issue of the *Journal of the South African Ornithologists' Union*. Among the species observed were the white and black stork, the European swallow, and several kinds of cuckoos.

In the July issue of *The Emu* Dr. J. B. Cleland continues his account of the results of an examination of the contents of the crops and stomachs of Australian birds, the total number of species which have passed through his hands being 305. Farmers and gardeners should now be able to discriminate without difficulty between beneficial and harmful birds.

A hand-list of the birds of Formosa, by Mr. S. Uchida, is included in vol. iii. part i., of *Annotationes Zoologicae Japonenses*. In a list published in 1907 by Messrs. Ogilvie-Grant and La Touche, 260 Formosan species were recognised; the author has been able to raise the number to 290. The discovery of a species of *Dicœum* has introduced an additional family into the avifauna of the island. We notice that on page 169 *Cuculus canorus* is misprinted *Cuculus canolus*, the error being repeated on page 209 of the distributional list.

No. 23 of *Harmsworth Popular Science* contains an article on the difficulties of bird-classification, although its contents scarcely bear out the title. There are, moreover, statements which do not represent the facts, as, for instance, the assertion that the seriema was originally grouped with the secretary-bird. Again, we find it stated on page 2736 that "the boat-billed heron, . . . the whale-headed stork, . . . and the hammer-head are famous members of the heron tribe," whereas these three birds severally represent the same number of distinct families, which in the British Museum Hand-list are assigned to as many suborders.

In *British Birds* for September, Mr. H. W. Robinson states that two nests of the eider were observed on June 2, 1912, on a small island just off the coast of Ireland. Hitherto eiders have been known in Ireland only as occasional stragglers. It is a matter for regret that in each instance the eggs were taken.

In Reichenow's *Ornithologische Monatsberichte* for July and August, 1912, Mr. J. Thienemann records that a laughing gull (*Larus ridibundus*), marked at Rositten, was shot on a swamp in the West Indies in November, 1911.

R. L.